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## TABLES

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**Table 2-1  
Newmark and Muscoy OU RD/RA Timeline  
December 2005**

Phase	Element	Location	Time Period
Newmark ROD			
Record of Decision	Newmark OU	ROD issued	August 4, 1993
Newmark RD			
100% Design Submittal	Water Treatment Plants	Newmark North Water Treatment Plant	September 1997
		Newmark South Water Treatment Plant	September 1997
Newmark RA			
Construction	Water Treatment Plants	Newmark North Water Treatment Plant	September 1997 - July 1998
		Newmark South Water Treatment Plant	September 1997 - July 1998
		17th Street Plant Retrofit	August 1998 - October 1998
		GAC Vessels	June 1997 - September 1998
	Pipelines	Freeway Bridge Overcrossing	April 1998 - June 1998
	Monitoring Wells	MW-12 through MW-15	August 1997 - October 1997
		MW-16 through MW-17	October 1997 - November 1997
	Pipelines	North Pipeline	March 1998 - October 1998
		South Pipeline	September 1996 - October 1998
	Extraction Wells	North Well EW-6, EW-7, Newmark-3	September 1996 - May 1997
EW-1 through EW-5		September 1996 - May 1997	
Muscoy ROD			
Record of Decision	Muscoy OU	ROD issued	March 25, 1995
Muscoy RD			
100% Design Submittal	Water Treatment Plants	Muscoy 19th Street Water Treatment Plant	September 2003
Muscoy RA			
Construction	Water Treatment Plant	Muscoy 19th Street Water Treatment Plant	March 2004 - February 2006
	Booster Pump Station	Encanto Park Booster Pump Station	March 2004 - February 2006
	Pipelines	Pipeline Phase I	August 2000 - February 2001
		Pipeline Phase II	August 2002 - May 2003
		I-215 / BNSF Railroad Undercrossing	December 2004 - April 2005
	Monitoring Wells	MW-135 through MW-139	February 2002 - April 2002
	Extraction Wells	EW-108 through EW-112	May 2001 - December 2004
Shakedown Period	Water Treatment Plant	Muscoy 19th Street Water Treatment Plant	March 2005 - May 2005
One Year Performance Evaluation Period	Water Treatment Plant	Muscoy 19th Street Water Treatment Plant	July 2005 - July 2006

EW - Extraction Well  
MW - Monitoring Well  
OU - Operable Unit  
RA - Remedial Action  
RD - Remedial Design  
ROD - Record of Decision

**Table 2-2  
Muscoy OU Extraction Well Construction Details  
December 2005**

Well	HS Zone	Casing Elevation (ft above msl)	Casing Diameter (in)	Screened Interval (ft bgs)	Screen Slot Size (in)	Gravel Fill Pipe Depths (ft bgs)	Camera Tube Depth (ft bgs)	Total Well Depth (ft bgs)	Design Flow Rate (gpm)	Pump Size (hp)
EW-108	2	1119.26	20	510-590 670-1000	0.07	310 510	NA	1010	1,300	300
EW-108PA	1	1119.26	4	370-390	0.02			390		
EW-108PB	3	1119.26	4	740-760	0.02			760		
EW-109	2	1137.05	20	260-330 420-500 550-610 710-840	0.08	260 420 710	405	860	1,300	300
EW-109PZA	1	1137.05	4	310-330	0.02			330		
EW-109PZB	2	1137.05	4	430-450	0.02			450		
EW-109PZC	3	1137.05	4	800-820	0.02			820		
EW-110	2	1149.30	20	225-270 305-650 715-855	0.08	305 710	395.5	865	2,500	500
EW-110PZA	0.5	1145.50	3	193.5-243.5	0.02			243.5		
EW-110PZB	1	1145.48	3	301.5-321.5	0.02			321.5		
EW-110PZC	1.9	1145.49	3	411.5-431.5	0.02			431.5		
EW-110PZD	2	1145.51	3	491.5-511.5	0.02			511.5		
EW-110PZE	3	1149.30	4	830-850	0.02			850		
EW-111	2	1169.51	20	235-265 305-665 765-1250	0.08	305 765	410	1260	2,500	500
EW-111PZA	0.5	1165.68	3	193.5-243.5	0.02			243.5		
EW-111PZB	1	1165.69	3	375.5-395.5	0.02			395.5		
EW-111PZC	2	1165.70	3	456-476	0.02			476		
EW-111PZD	2.1	1169.49	4	780-800	0.02			800		
EW-112	2	1181.79	20	280-740 800-890	0.08	270 800	NA	900	1,300	300
EW-112PA	1	1181.79	4	300-320	0.02			320		
EW-112PB	2	1181.79	4	660-680	0.02			680		

bgs=below ground surface  
 EW=extraction well  
 ft=foot  
 gpm=gallons per minute  
 hp=horsepower  
 HS= Hydrostratigraphic Zone  
 in=inch  
 msl=mean sea level  
 NA= not available  
 OU=operable unit

**Table 2-3**  
**Muscoy OU Monitoring Well Construction Details**  
**December 2005**

Well	HS Zone	Upgradient or Downgradient	Casing Elevation (ft above msl)	Total Well Depth	Casing Diameter	Screened Interval	Screen Slot Size
				(ft)	(in)	(ft bgs)	(in)
MW-128A	1	UG	1215.04	440	4	410-440	0.02
MW-128B	1.5	UG	1215.04	720	4	690-720	0.02
MW-128C	2	UG	1215.04	890	4	860-890	0.02
MW-129A	1	UG	1199.32	473	4	443-473	0.02
MW-129B	2	UG	1198.91	760	4	730-760	0.02
MW-129C	2.1	UG	1198.92	881	4	851-881	0.02
MW-130A	1	UG	1175.22	370	4	340-370	0.02
MW-130B	1.5	UG	1174.58	580	4	550-580	0.02
MW-130C	2	UG	1174.56	920	4	890-920	0.02
MW-135A	1	DG	1111.28	380	4	360-380	0.02
MW-135B	3	DG	1111.28	640	4	620-640	0.02
MW-135C	3	DG	1111.3	870	4	850-870	0.02
MW-136A	1.9	DG	1121.67	440	4	420-440	0.02
MW-136B	2	DG	1121.63	520	4	500-520	0.02
MW-136C	3	DG	1121.61	750	4	730-750	0.02
MW-137A	1	DG	1144.05	350	4	330-350	0.02
MW-137B	2	DG	1144.1	540	4	520-540	0.02
MW-137C	3	DG	1144.07	810	4	790-810	0.02
MW-138A	1	DG	1156.87	340	4	320-340	0.02
MW-138B	2	DG	1156.92	570	4	550-570	0.02
MW-138C	3	DG	1156.99	980	4	960-980	0.02
MW-139A	1	DG	1168.76	380	4	360-380	0.02
MW-139B	2	DG	1168.71	560	4	540-560	0.02
MW-139C	3	DG	1168.85	810	3	790-810	0.01

bgs=below ground surface

DG=downgradient

EW=extraction well

ft=foot

gpm=gallons per minute

HS= Hydrostratigraphic Zone

in=inch

msl=mean sea level

OU=operable unit

UG=upgradient

**Table 2-4**  
**Hydrostratigraphic Zones for Newmark and Muscoy Water-Level And Plume Delineation**

URS Well Name	City Well Name	HS Zone	Well Elevation (ft msl)	Screen Length (ft)	Screen Interval (ft bgs)	Layer	Stratigraphic Regime	Use For GWL Contouring	Use for Plume Delineation
EW-1	EPA 001	3	1093.90	590	600-1190	Deep	Newmark		X
EW-1A	EPA 001A	1	1093.90	20	380-400	Shallow	Newmark	X	X
EW-1B	EPA 001B	3	1119.26	20	980-1000	Deep	Newmark	X	
EW-2	EPA 002	3	1091.70	570	500-1070	Deep	Newmark		X
EW-2A	EPA 002A	1	1091.70	20	230-250	Shallow	Newmark	X	X
EW-2B	EPA 002B	3	1093.90	20	880-900	Deep	Newmark	X	
EW-3	EPA 003	3	1090.22	420	240-280, 320-400, 500-800	Deep	Newmark		X
EW-3A	EPA 003A	1	1090	20	230-250	Shallow	Newmark	X	X
EW-3B	EPA 003B	3	1090	20	760-780	Deep	Newmark	X	
EW-4	EPA 004	3	1086.27	690	490-1180	Deep	Newmark	X	X
EW-4A	EPA 004A	1	1086	20	310-330	Shallow	Newmark	X	X
EW-4B	EPA 004B	3	1086	20	980-1000	Deep	Newmark		
EW-5	EPA 005	3	1083.27	730	400-1130	Deep	Newmark		X
EW-5A	EPA 005A	1	1083	20	230-250	Shallow	Newmark	X	X
EW-5B	EPA 005B	3	1083	20	880-900	Deep	Newmark	X	
EW-108	EPA 108	2	1119.26		510-590, 670-1000	Deep	Newmark		X
EW-108A	EPA 108A	1	1119.26	20	370-390	Shallow	Muscoy	X	X
EW-108B	EPA 108B	3	1119.26	20	740-760	Deep	Newmark	X	
EW-109	EPA 109	2	1137.05		260-330, 420-500, 550-610, 710-840	All	Muscoy		
EW-109A	EPA 109A	1	1137.05	20	310-330	Shallow	Muscoy	X (correct for well inefficiency)	X
EW-109B	EPA 109B	2	1137.05	20	430-450	Intermediate*	Muscoy	X (correct for well inefficiency)	X
EW-109C	EPA 109C	3	1137.05	20	800-820	Deep	Muscoy	Chemistry Only/no Water Level	X
EW-110	EPA 110	2	1145.50		225-270, 305-650, 715-855,	All	Muscoy		
EW-110A	EPA 110A	0.5	1145.50	40	193.5-243.5	Shallow	Muscoy		
EW-110B	EPA 110B	1	1145.48	20	301.5-321.5	Shallow	Muscoy	X	X
EW-110C	EPA 110C	1.9	1145.49	20	411.5-431.5	Intermediate	Muscoy		
EW-110D	EPA 110D	2	1145.51	20	491.5-511.5	Intermediate	Muscoy	X	X
EW-110E	EPA 110E	3	1149.30	20	830-850	Deep	Muscoy		X
EW-111	EPA 111	2	1165.68		235-265, 305-665, 765-1250	All	Muscoy		
EW-111A	EPA 111A	0.5	1165.68	40	193.5-243.5	NA	Muscoy		
EW-111B	EPA 111B	1	1165.69	20	375.5-395.5	Shallow	Muscoy	X	X

**Table 2-4**  
**Hydrostratigraphic Zones for Newmark and Muscoy Water-Level And Plume Delineation**

URS Well Name	City Well Name	HS Zone	Well Elevation (ft msl)	Screen Length (ft)	Screen Interval (ft bgs)	Layer	Stratigraphic Regime	Use For GWL Contouring	Use for Plume Delineation
EW-111C	EPA 111C	2	1165.70	20	456-476	Intermediate	Muscoy	X	X
EW-111D	EPA 111D	2.1	1169.49	20	780-800	*	Muscoy		X
EW-112	EPA 112	2	1181.79		280-740, 800-890	All	Muscoy		
EW-112A	EPA 112A	1	1181.79	20	300-320	Shallow	Muscoy - West of Fault**	X (correct for well inefficiency)	X
EW-112B	EPA 112B	2	1181.79	20	660-680	Intermediate	Muscoy - West of Fault*	X (correct for well inefficiency)	X
MUNI-101	Olive & Garner	2	1130.00	700	350-1050	Intermediate	Muscoy	Water Level/ Chemistry Diluted	X (shallow chem accounting for diluted chemistry)
MUNI-102	Baseline and California	1	1185.56	196	126-184, 224-232, 262-304, 312-372, 468-476, 540-560	Intermediate	Muscoy - West of Fault*	Chemistry and gwl	
MUNI-103	MW State	1	1214.58	168	60-128, 248-345	Shallow	Muscoy - West of Fault*	Chemistry and gwl	
MUNI-104A	19th #1	1	1230.30	250	150-276, 322-356, 388-400	Shallow	Muscoy	Chemistry and gwl	
MUNI-104B	19th #2	2	1236.25	185	470-512, 554-563, 575-611, 646-658	Intermediate	Muscoy	Chemistry and gwl	
MUNI-107	Colima Replacement	1			To Be Determined	All	X	?	X
MUNI-108	Mallory	2	1319.00	222	350-448, 478-484, 510-628	Intermediate	Muscoy - West of Fault*	Chemistry and gwl	
MUNI-109	Paperboard	1	1328.00	204	227-431	Dry*			
MUNI-112	Cajon #3	1	1894.00	97	150-347	Shallow			
MUNI-116	Muscoy Mutual #5	2	1475.33			Intermediate	Muscoy - West of Fault*	Should Start Sounding Soon	
MUNI-13	Waterman	1	1244.40	324	258-267, 295-610	Shallow			
MUNI-14	31st and Mountain View	2	1233.01	228	325-553	Intermediate			
MUNI-16	Leroy	1*	1239.67	210	450-660	Shallow*			
MUNI-18	27th and Acacia	2	1184.07	510	243-259, 290-410, 442-456, 477-717	Intermediate			
MUNI-20	23rd and E	2	1174.75	370	354-370, 428-448, 494-828	Intermediate			
MUNI-22	17th & Sierra #1	2	1141.90	175	494-571, 575-670	Intermediate			
MUNI-23	16th & Sierra	2				Intermediate			

**Table 2-4**  
**Hydrostratigraphic Zones for Newmark and Muscoy Water-Level And Plume Delineation**

URS Well Name	City Well Name	HS Zone	Well Elevation (ft msl)	Screen Length (ft)	Screen Interval (ft bgs)	Layer	Stratigraphic Regime	Use For GWL Contouring	Use for Plume Delineation
MUNI-24	Gilbert	2	1123.33	183	480-603, 625-685	Intermediate			
MW-10A	MW-010A	1.5	1127.42	30	350-380				
MW-10B	MW-010B	1.9	1127.42	30	490-520				
MW-10C	MW-010C	3	1127.42	30	750-780	Deep			
MW-11A	MW-011A	3	1100.52	30	500-530	Deep	Newmark		
MW-11B	MW-011B	3	1100.52	30	770-800	Deep	Newmark	X	X
MW-11C	MW-011C	3	1100.52	30	1070-1100	Deep	Newmark		
MW-12A	MW-012A	1	1088.51	30	240-270	Shallow	Muscoy *	X	X
MW-12B	MW-012B	3	1088.51	30	670-700	Deep	Newmark	X	X
MW-12C	MW-012C	3	1088.53	30	1040-1070	Deep	Newmark		
MW-13A	MW-013A	1	1078.36	30	365-395	Shallow	Newmark	X	X
MW-13B	MW-013B	3	1078.36	30	525-555	Deep	Newmark	X	X
MW-13C	MW-013C	3	1078.29	30	815-845	Deep	Newmark		
MW-14A	MW-014A	1	1075.73	30	270-300	Shallow	Newmark	X	X
MW-14B	MW-014B	3	1075.73	30	570-600	Deep	Newmark	X	X
MW-14C	MW-014C	3	1075.73	30	1060-1090	Deep	Newmark		
MW-15A	MW-015A	2	1069.38	30	520-550	Deep	Newmark		
MW-15B	MW-015B	3	1069.38	30	690-720	Deep	Newmark	X	X
MW-15C	MW-015C	2.5	1069.38	30	1020-1050	Deep	Newmark		
MW-128A	MW-128A	1	1215.04	30	410-440	Shallow	Muscoy		
MW-128B	MW-128B	1.5	1215.04	30	690-720	Intermediate*	Muscoy		
MW-128C	MW-128C	2	1215.04	30	860-890	Intermediate	Muscoy		
MW-129A	MW-129A	1	1199.32	30	443-473	Shallow	Muscoy		
MW-129B	MW-129B	2	1198.91	30	730-760	Intermediate	Muscoy		
MW-129C	MW-129C	2.1	1198.92	30	851-881	*	Muscoy		
MW-130A	MW-130A	1	1175.22	30	340-370	Shallow	Muscoy		
MW-130B	MW-130B	1.5	1174.58	30	550-580	Shallow	Muscoy		
MW-130C	MW-130C	2	1174.56	30	890-920	Interm.	Muscoy		
MW-135A	MW-135A	1	1111.28	20	360-380	Shallow	Muscoy		
MW-135B	MW-135B	3	1111.28	20	620-640	Deep	Newmark		
MW-135C	MW-135C	3	1111.30	20	850-870	Deep	Newmark		
MW-136A	MW-136A	1.9	1121.67	20	420-440	Intermediate	Muscoy		
MW-136B	MW-136B	2	1121.63	20	500-520	Intermediate	Muscoy		
MW-136C	MW-136C	3	1121.61	20	730-750	Deep	Muscoy		
MW-137A	MW-137A	1	1144.05	20	330-350	Shallow	Muscoy		
MW-137B	MW-137B	2	1144.10	20	520-540	Intermediate	Muscoy		
MW-137C	MW-137C	3	1144.07	20	790-810	Deep	Muscoy		
MW-138A	MW-138A	1	1156.87	20	320-340	Shallow	Muscoy		
MW-138B	MW-138B	2	1156.92	20	550-570	Intermediate	Muscoy		
MW-138C	MW-138C	3	1156.99	20	960-980	Deep	Muscoy		
MW-139A	MW-139A	1	1168.76	20	360-380	Shallow	Muscoy - West of Fault*		
MW-139B	MW-139B	2	1168.71	20	540-560	Intermediate	Muscoy - West of Fault*		
MW-139C	MW-139C	3	1168.85	20	790-810	Deep	Muscoy - West of Fault*		
Encanto USGS	Garner Park B	1	1120.00	25	241-256	Shallow	Muscoy		
Encanto USGS	Garner Park C	2	1120.00	34	536-550	Intermediate*	Muscoy	X	

**Table 2-4**  
**Hydrostratigraphic Zones for Newmark and Muscoy Water-Level And Plume Delineation**

URS Well Name	City Well Name	HS Zone	Well Elevation (ft msl)	Screen Length (ft)	Screen Interval (ft bgs)	Layer	Stratigraphic Regime	Use For GWL Contouring	Use for Plume Delineation
	Sierra High School A	0.5	1077	20	170-190	NA	Newmark		
	Sierra High School B	1*	1077	60	340-400	Shallow*	Newmark	X ?	
	Sierra High School C	3	1077	10	520-530	Deep	Newmark	X	
	9th				270-830,850-970,1000-1030	All	On fault*		X (shallow chem accounting for diluted chemistry)
	Perris				240-640,690-950	All	Muscoy - West of Fault*		X (shallow chem accounting for diluted chemistry)
MUNI-105	Mt. Vernon	1*	1354.21	83	225-308 or to 598 (not clear from City data)	Shallow	Muscoy - West of Fault*	X ? (if accessible and no oil)	X ?

\*= Unable to determine.

bgs=below ground surface

ft=foot

GWL= ground water level

HS=Hydrostratigraphic zones: Zone 1 (shallow aquifer) is above confining layer ~600-700 ft msl (~500 ft bgs). Zone 2 is the upper portion of the deep aquifer (intermediate zone). Zone 3 is the lower portion of the deep aquifer. Fractional zones show intermediate screen intervals roughly based on relative water levels.

msl=mean sea level

MW=monitoring well

USGS=United States Geological Survey



Table 3-1  
Muscoy Project Event and Deliverable Tracker

Muscoy Operation and Functional Period: Officially started on July 25, 2005.																
MUSCOY OU SHAKEDOWN LOG OF EVENTS BEGINNING FEBRUARY 16, 2005																
Summary of Shakedown & Startup			From	To												
	System pre start up		3/14/2005	6/17/2005												
	4 week start up test (shake down)		3/14/2005	6/10/2005												
	1 week recovery		6/13/2005	6/17/2005												
	Extraction well sequential start up		6/20/2005	7/22/2005												
	EW-108 program SCADA system and manual WLs		6/20/2005	6/24/2005												
	EW-109 program SCADA system and manual WLs		6/27/2005	7/1/2005												
	EW-110 program SCADA system and manual WLs		7/5/2005	7/8/2005												
	EW-111 program SCADA system and manual WLs		7/11/2005	7/15/2005												
	EW-112 program SCADA system and manual WLs		7/18/2005	7/22/2005												
Baseline sampling (Month 0) concurrent w/ LTMP			4/4/2005	4/19/2005												
	PDB deployment		4/4/2005	4/7/2005												
	GW sampling		4/11/2005	4/21/2005												
	Receive preliminary data		5/19/2005													
	Receive final lab data		9/1/2005													
System on line (START UP) on 7/25/2005			Responsible													
Monthly operation from August 2005 to July 2006			Party	August 2005	September 2005	October 2005	November 2005	December 2005	January 2006	February 2006	March 2006	April 2006	May 2006	June 2006	July 2006	
	Water-level from SBMWD to URS		SBMWD	9/15/2005	10/15/2005	11/15/2005	12/15/2005	1/15/2006	2/15/2006	x	x	x	x	x	x	x
	Plant operational data from SBMWD to URS		SBMWD	10/3/2005	10/13/2005	11/16/2005	12/20/2005	1/13/2006	2/15/2006	x	x	x	x	x	x	x
	URS monthly plant inspection		URS	9/7/2005	10/11/2005	11/16/2005	12/14/005	1/19/2006	2/16/2006	3/22/2006	4/26/2006	x	x	x	x	x
	Request for analysis		URS	7/14/2005	8/25/2005	9/28/2005	10/20/2005	11/22/2005	12/20/2005	1/23/2006	3/2/2006	3/27/2006	4/14/2006	x	x	x
	Lab assignment		EPA	8/16/2005	9/13/2005	10/11/2005	11/7/2005	12/8/2005	1/5/2006	2/15/2006	3/20/2006	4/20/2006	x	x	x	x
	Deploy PDBs		URS	8/9/2005	8/24/2005	9/21/2005	10/19/2005	11/16/2005	12/14/2005				4/17/2006		x	
	Monthly/quarterly GW sampling (wells)		URS	8/24/2005	9/21/2005	10/19/2005	11/16/2005	12/14/2005	1/12/2006				x (site-wide)		x (late-July)	
	Deploy next sampling event PDBs		URS	8/24/2005	9/21/2005	10/19/2005	11/16/2005	12/14/2005	1/12/2006						x	
	Monthly treatment plant sampling		SBMWD	8/17/2005	9/30/2005	10/24/2005	11/16/2005	12/14/2005	1/12/2006	2/21/2006	3/21/2006	4/19/2006		x	x	
	Receive final lab data		URS	9/14/2005	10/11/2005	10/31/2005	12/6/2005	1/3/2006	2/1/2006	x	4/12/2006	x	x	x	x	x
	Receive validated data		URS	11/17/2005	4/26/2006	4/13/2006	4/13/2006	04/26/06	4/13/2006	x	x	x	x	x	x	x
	Draft monthly report		URS	x	x	x	x	x	x	x	x	x	x	x	x	x
	Report comments		EPA/SBMWD	x	x	x	x	x	x	x	x	x	x	x	x	x
	Final monthly report		URS	x	x	x	x	x	x	x	x	x	x	x	x	x
	Other general comments		EPA/SBMWD	x	x	x	x	x	x	x	x	x	x	x	x	x
Spinner tests																
	Perform spinner tests		URS			10/10/2005						4/25/2006				
	Analyze data		URS				11/28/2005						x			
	Draft report		URS					12/8/2005						x		
	Report comments		EPA/SBMWD						x							x
	Final report		URS							x						x
	Other general comments		EPA/SBMWD								x					x
Zone sampling																
	Conduct zone sampling		URS		1/16-1/17/06				1/18/2006			4/25/2006				
	Receive final lab data		URS		2/3/2006				2/1/2006	2/15/2006			x			
	Receive validated data		URS					4/13/2006	x				x			
	Other general comments		EPA/SBMWD						x				x			
Long Term Monitoring Plan (LTMP) for both Newmark and Muscoy				August 2005	September 2005	October 2005	November 2005	December 2005	January 2006	February 2006	March 2006	April 2006	May 2006	June 2006	July 2006	
	Deploy PDBs for wells not sampled by SBMWD		URS			10/20/2005						4/18/06*				
	Conduct LTMP samples for Newmark and Muscoy		URS				11/11/2005						x			
	Receive final lab data		URS				12/6/2005	12/6/2005								
	Receive validated data		URS				4/13/2006						x			
	Draft report (included in monthly report)		URS				x						x			
	Report comments		EPA/SBMWD				x						x			
	Final report (included in monthly report)		URS				x						x			
	Other general comments		EPA/SBMWD				x						x			
* Note: URS also deployed PDBs for SBMWD in MWs 135-139 to assist City (these are wells for which they desire to split samples)																
Semi-annual Performance Reports				August 2005	September 2005	October 2005	November 2005	December 2005	January 2006	February 2006	March 2006	April 2006	May 2006	June 2006	July 2006	
	1st semi-annual performance report															
	Including all shake down and start up data analysis		URS													

Table 3-1  
Muscoy Project Event and Deliverable Tracker

Including flow data analysis for months	URS	x	x	x	x	x	x							
Including monthly chemical data analysis for months	URS	x	x	x	x	x	x							
Including zone sampling analysis for month	URS						x							
Including LTMP analysis for month	URS													
Draft report	URS											x		
Comments	EPA/SBMWD											x		
Final report	URS												x	
Other general comments	EPA/SBMWD												x	
<b>2nd semi-annual performance report</b>														
Including flow data analysis for months	URS								x	x	x	x	x	x
Including monthly chemical data analysis for months	URS										x			x
Including zone sampling analysis for month	URS										x			
Including LTMP analysis for month	URS											x		
Draft report (due 12/12/06)	URS													
Comments (due 1/25/07)	EPA/SBMWD													
Final report (due 2/27/07)	URS													
Other general comments	EPA/SBMWD													
<b>Other deliverables (see Deliverables Table)</b>			<b>August 2005</b>	<b>September 2005</b>	<b>October 2005</b>	<b>November 2005</b>	<b>December 2005</b>	<b>January 2006</b>	<b>February 2006</b>	<b>March 2006</b>	<b>April 2006</b>	<b>May 2006</b>	<b>June 2006</b>	<b>July 2006</b>
Draft Pipeline Phase I Report (submitted 8/9/01)	URS													
Comments (none received)	EPA/SBMWD/E2													
Final Pipeline Phase I Inspection Report	URS						12/20/2005							
Draft Pipeline Phase II Report (submitted 7/21/03)	URS													
Comments (none received)	EPA/SBMWD/E2													
Final Pipeline Phase II Inspection Report	URS						12/20/2005							
Draft I215/BNSF Inspection Report (submitted 5/5/05)	URS													
Comments (none received)	EPA/SBMWD/E2													
Final I215/BNSF Construction Inspection Report	URS						12/20/2005							
Draft Treatment Plant Construction Inspection Report	URS											x		
Comments	EPA/SBMWD/E2											x		
Final Treatment Plant Construction Inspection Report	URS												x	
Draft Carbon Vessel Construction Inspection Report	URS				10/18/2005									
Comments	EPA/SBMWD/E2						1/26/2006							
Final Carbon Vessel Construction Inspection Report	URS										4/10/2006			
Draft Extraction Well and Monitoring Well Installation Report	URS											x		
Comments	EPA/SBMWD/E2												x	
Final Extraction Well and Monitoring Well Installation Report	URS													x
Draft O&M Manual (submitted 3/9/05)	URS													
Comments	EPA/SBMWD/E2										x			
Final O&M Manual	URS												x	
Draft Cost and Performance Report (due 2/27/07)	URS													
Comments (due 4/12/07)	EPA/SBMWD/E2													
Final Cost and Performance Report (due 4/27/07)	URS													
Draft RA Report (due 3/28/07)	URS													
Comments (due 5/11/07)	EPA/SBMWD/E2													
Final RA Report (due 5/28/07)	URS													
Draft Well Site Report	SBMWD													
Comments	EPA/URS/E2													
Final Well Site Report	SBMWD													
	SBMWD													

**Table 4-1**  
**Groundwater Elevation Collection Methods and Frequencies**

Monitoring Point ID	GW Elevation Collection Method	Minimum GW Elevation Collection Frequency
CJ-10	Manual	4 times yearly
CJ-11	Manual	4 times yearly
CJ-12	Manual	4 times yearly
CJ-13	Manual	4 times yearly
CJ-14	Manual	4 times yearly
CJ-15	Manual	4 times yearly
CJ-16	Manual	4 times yearly
CJ-17	Manual	4 times yearly
CJ-3	Manual	4 times yearly
CJ-8	Manual	4 times yearly
EW-1	Manual	monthly
EW-108	Manual	monthly
EW-108PA	SCADA	2 times daily
EW-108PB	SCADA	2 times daily
EW-109	Manual	monthly
EW-109PA	SCADA	2 times daily
EW-109PB	SCADA	2 times daily
EW-110	Manual	monthly
EW-110PA	SCADA	2 times daily
EW-110PB	SCADA	2 times daily
EW-110PC	SCADA	2 times daily
EW-110PD	SCADA	2 times daily
EW-110PE	SCADA	2 times daily
EW-111	Manual	monthly
EW-111PA	SCADA	2 times daily
EW-111PB	SCADA	2 times daily
EW-111PC	SCADA	2 times daily
EW-111PD	SCADA	2 times daily
EW-112	Manual	monthly
EW-112PA	SCADA	2 times daily
EW-112PB	SCADA	2 times daily
EW-1PA	SCADA	2 times daily
EW-1PB	SCADA	2 times daily
EW-2	Manual	monthly
EW-2PA	SCADA	2 times daily
EW-2PB	SCADA	2 times daily
EW-3	Manual	monthly
EW-3PA	SCADA	2 times daily
EW-3PB	SCADA	2 times daily
EW-4	Manual	monthly
EW-4PA	SCADA	2 times daily
EW-4PB	SCADA	2 times daily
EW-5	Manual	monthly
EW-5PA	SCADA	2 times daily
EW-5PB	SCADA	2 times daily
EW-6	Manual	monthly
EW-6PA	SCADA	2 times daily
EW-7	Manual	monthly
EW-7PA	SCADA	2 times daily
MUNI-07B	Manual	4 times yearly

**Table 4-1**  
**Groundwater Elevation Collection Methods and Frequencies**

<b>Monitoring Point ID</b>	<b>GW Elevation Collection Method</b>	<b>Minimum GW Elevation Collection Frequency</b>
MUNI-09B	Manual	4 times yearly
MUNI-09C	Manual	4 times yearly
MUNI-103	Manual	4 times yearly
MUNI-109	Manual	4 times yearly
MUNI-11A	Manual	4 times yearly
MUNI-11C	Manual	4 times yearly
MW02A	Manual	4 times yearly
MW02B	Manual	4 times yearly
MW03A	Manual	4 times yearly
MW03B	Manual	4 times yearly
MW04A	SCADA	2 times daily
MW04B	SCADA	2 times daily
MW05A	Manual	4 times yearly
MW05B	Manual	4 times yearly
MW06A	Manual	4 times yearly
MW06B	Manual	4 times yearly
MW07A	SCADA	2 times daily
MW07B	SCADA	2 times daily
MW08A	Manual	4 times yearly
MW08B	Manual	4 times yearly
MW09A	SCADA	2 times daily
MW09B	SCADA	2 times daily
MW10A	SCADA	2 times daily
MW10B	SCADA	2 times daily
MW11A	SCADA	2 times daily
MW11B	SCADA	2 times daily
MW-128A	INW	2 times daily
MW-128B	INW	2 times daily
MW-128C	INW	2 times daily
MW-129A	INW	2 times daily
MW-129B	INW	2 times daily
MW-129C	INW	2 times daily
MW12A	SCADA	2 times daily
MW12B	SCADA	2 times daily
MW-130A	INW	2 times daily
MW-130B	INW	2 times daily
MW-130C	INW	2 times daily
MW-131A	Manual	4 times yearly
MW-131B	Manual	4 times yearly
MW-131C	Manual	4 times yearly
MW-132A	Manual	4 times yearly
MW-132B	Manual	4 times yearly
MW-133A	Manual	4 times yearly
MW-133B	Manual	4 times yearly
MW-134	Manual	4 times yearly
MW-135A	INW	2 times daily
MW-135B	INW	2 times daily
MW-135C	INW	2 times daily
MW-136A	INW	2 times daily
MW-136B	INW	2 times daily

**Table 4-1**  
**Groundwater Elevation Collection Methods and Frequencies**

Monitoring Point ID	GW Elevation Collection Method	Minimum GW Elevation Collection Frequency
MW-137A	INW	2 times daily
MW-137B	INW	2 times daily
MW-137C	INW	2 times daily
MW-138A	INW	2 times daily
MW-138B	INW	2 times daily
MW-138C	INW	2 times daily
MW-139A	INW	2 times daily
MW-139B	INW	2 times daily
MW-139C	INW	2 times daily
MW13A	SCADA	2 times daily
MW13B	SCADA	2 times daily
MW13C	SCADA	2 times daily
MW14A	SCADA	2 times daily
MW14B	SCADA	2 times daily
MW15A	SCADA	2 times daily
MW15B	SCADA	2 times daily
MW16A	SCADA	2 times daily
MW16B	SCADA	2 times daily
MW17A	SCADA	2 times daily
MW17B	SCADA	2 times daily
MWCOE001A	Manual	4 times yearly
MWCOE001B	Manual	4 times yearly
MWCOE002	Manual	4 times yearly
MWCOE003	Manual	4 times yearly
MWCOE004	Manual	4 times yearly
MWCOE005	INW	2 times daily
MWCOE006	INW	2 times daily
MWCOE007	INW	2 times daily
MWCOE008	Manual	4 times yearly

INW=Instrumentation Northwest

SCADA=supervisory control and data acquisition

**Table 4-2**  
**Muscoy Plume Extraction System Performance Monitoring Sampling Locations and Rationale**

Well Designation	Cross Reference/Location	Rationale for Monitoring	Operable Unit
<b>Extraction Wells</b>			
EW-108, EW-108PA, EW-108PB	Northwest corner of 13th Street and G Street	To monitor treatment plant influent and plume concentrations.	Muscoy
EW-109, EW-109PA, EW-109PB	North side Home Street between Peris Street and Herris Street	To monitor treatment plant influent and plume concentrations.	Muscoy
EW-110, EW-110A, EW-110B, EW-110C, EW-110D, EW-110E	East side Garner Street approximately 400 feet south of 14th Street	To monitor treatment plant influent and plume concentrations.	Muscoy
EW-111, EW-111A, EW-111B, EW-111C, EW-111D	Southwest corner of Pico Street and 14th Street	To monitor treatment plant influent and plume concentrations.	Muscoy
EW-112, EW-112PA, EW-112PB	North side of Virginia Street approximately 200 feet east of Medical Center Drive	To monitor treatment plant influent and plume concentrations.	Muscoy
<b>Monitoring Wells</b>			
MW-128A, 128B, 128C	Across from Knights of Columbus	Monitoring points upgradient from the Muscoy plume front extraction well network.	Muscoy
MW-129A, 129B, 129C	16 th Street, west of Medical Center Drive	Monitoring points upgradient from the Muscoy plume front extraction well network.	Muscoy
MW-130A, 130B, 130C	Mt. Vernon to 19th Street, left on Garner Street, wells at end of street	Monitoring points upgradient from the Muscoy plume front extraction well network.	Muscoy
MW-135A, 135B, 135C	Orange Street, west of H Street Interstate 215 South on-ramp) in sidewalk on southside of Orange Street.	Monitoring points downgradient from extraction wells, used to monitor groundwater extraction system effectiveness.	Muscoy
MW-136A, 136B, 136C	11th Avenue between Perris Street and L Street, in landscaping north side of street	Monitoring points downgradient from extraction wells, used to monitor groundwater extraction system effectiveness.	Muscoy
MW-137A, 137B, 137C	Herrington Avenue, south of Baseline on west side of street	Monitoring points downgradient from extraction wells, used to monitor groundwater extraction system effectiveness.	Muscoy
MW-138A, 138B, 138C	Western Avenue, south of Baseline on sidewalk on west side of street	Monitoring points downgradient from extraction wells, used to monitor groundwater extraction system effectiveness.	Muscoy
MW-139A, 139B, 139C	Wilson Avenue, south of Baseline on east side of street	Monitoring points downgradient from extraction wells, used to monitor groundwater extraction system effectiveness.	Muscoy
MW-140A, 140B, 140C	Garner Park, Encanto Park	Monitoring points downgradient from extraction wells, used to monitor groundwater extraction system effectiveness.	Muscoy

**Table 5-1**  
**19th Street Treatment Plant Operational Issue Status**  
**December 2005**

**Reporting Period:** December 2005  
**System Shakedown Startup:** March 2005  
**Official System Startup:** July 25, 2005

Issue/Discrepancy	Responsibility	Recommended Corrective Action	Schedule	Notes/Conclusions
D/P transducer 4B not displaying data, reading "underr"	URS	Troubleshoot and repair as needed	Complete by 30 December 2005	URS is working with its subcontractors to repair.
No. 5 flowmeter not displaying on OIT	URS	Troubleshoot and repair as needed	Complete by 30 December 2005	URS is working with its subcontractors to repair.
Vessel 11A: 1-inch cap tether cable is loose	URS	Repair as needed.	Complete by 30 December 2005	URS is working with its subcontractors to repair.
Vessel 9A: 1-inch cap is missing	URS	Replace missing cap	Complete by 30 December 2005	URS is working with its subcontractors to replace.

D/P=differential pressure

OIT=operator interface terminal

**Table 5-2**  
**Encanto Park Booster Pump Station Operational Issue Status**  
**December 2005**

**Reporting Period:** December 2005  
**System Shakedown Startup:** March 2005  
**Official System Startup:** July 25, 2005

Issue/Discrepancy	Responsibility	Recommended Corrective Action	Schedule	Notes/Conclusions
SixCENSE probe set up in progress	URS	Setup, test, train SBMWD	Complete by 30 December 2005	URS is working with subcontractors to complete the probe installation.

SBMWD=City of San Bernardino Municipal Water Department



**Table 5-3**  
**Extraction Well Operational Issue Status**  
**December 2005**

**Reporting Period:** December 2005  
**System Shakedown Startup:** March 2005  
**Official System Startup:** July 25, 2005

Issue/Discrepancy	Responsibility	Recommended Corrective Action	Schedule	Notes/Conclusions
None reported				

**Table 5-4**  
**Monitoring Well Operational Issue Status**  
**December 2005**

**Reporting Period:** December 2005  
**System Shakedown Startup:** March 2005  
**Official System Startup:** July 25, 2005

Issue/Discrepancy	Responsibility	Recommended Corrective Action	Schedule	Notes/Conclusions
Communication issues with SCADA system.	SBMWD	Trouble shoot and repair as needed	Schedule not set	
Electrical panel interference from EW-109C.	SBMWD	Troubleshoot and repair as needed	No schedule set	

EW=extraction well

SBMWD=City of San Bernardino Municipal Water Department

SCADA=supervisory control and data acquisition

**Table 5-5**  
**Summary of Muscoy OU O&M - GAC Treatment Plant**  
**December 2005**

**Reporting Period:** December 2005  
**System Shakedown Startup:** March 2005  
**Official System Startup:** July 25, 2005

19th Street North GAC Treatment Plant	
Description routine maintenance performed	Daily equipment checks performed (see DHS report)
Description of problems encountered	1. Replaced communication cable and cards to re-establish communications for the Nitrate Analyzer. 2. Repaired vessel pair 5 & 6 flow rate through meter 3. Replaced a faulty lighting arrestor for SCADA radio antenna. 4. Repaired Booster 5 control program to enable the H.O.A. switch to properly shut down the booster pump. EPA001 runs in auto now. Nitrate analyzer operational. Booster 3 on line. All lead GAC vessels were backwashed on 12-13-05 due to increased differential pressures, found fine silts and sand to be the cause.
Description of process improvements implemented	EPA001 has been adjusted to run in auto now.

DHS=California Department of Health Services  
GAC=granular activated carbon  
H.O.A.=Hand, Off, Auto  
O&M=operations and maintenance  
OU=operable unit  
SCADA=supervisory control and data acquisition

**Table 5-6**  
**Summary of Treatment Plant Flow Data and Mass Removal Estimates**  
**December 2005**

Treatment Plant	Extraction Wells Treated By Plant	Treated Water Volume (acre-ft)	Average Monthly Flow Rate (gpm)	Estimated Monthly GAC Mass Removal <sup>(a)</sup> (lbs)	Estimated Cumulative GAC Mass Removal <sup>(b)</sup> (lbs)
19th Street GAC	EPA 001 <sup>(c)</sup> , EPA 108, EPA 109, EPA 110, EPA 111 and EPA 112	1,367.4	9,980	23.6	182.9

(a) - Monthly mass removal estimates are based on Monthly Treatment Summary sheets documented in monthly DHS reports.

(b) - Cumulative mass removal estimates are for the period since shakedown and startup activities commenced in March 2005.

(c) - Since the beginning of March, extracted groundwater from EPA 001 has been diverted to the 19th Street Treatment Plant. Therefore, the sum of volume of groundwater extracted from Muscoy OU wells differ from the sum of the volume treated by the 19th Street Treatment Plant.

acre-ft=volume of water sufficient to cover an acre of land to a depth of 1 foot, or approximately 325,851 U.S. gallons.

DHS=California Department of Health Services

EPA=United States Environmental Protection Agency

GAC=granular activated carbon

gpm=gallons per minute

lbs=pounds

OU=operable unit

**Table 5-7**  
**Summary of Muscoy OU O&M - Extraction Wells**  
**December 2005**

**Reporting Period:** December 2005  
**System Shakedown Startup:** March 2005  
**Official System Startup:** July 25, 2005

<b>Muscoy Plume Extraction Well Network (EPA 108, EPA 109, EPA-110, EPA-111 and EPA 112)</b>	
Description of routine maintenance performed	Daily equipment checks performed (see DHS report), monthly hands on physical, annual oil change, semi-annual check of VFD .
Description of problems encountered	Low flow on EPA110. EPA111 failure 12-28-05 at 1:44 a.m. The suspected cause was a loose connection on buss work. Well was back on line on 1-6-06 at 12:30 p.m.
Description of process improvements implemented	The combined extraction well flow is still approximately 5.0-5.5% lower than estimated in the original model. This is apparently due to wear of the EPA110 pump. No action planned at this time. Wells EPA108, EPA109 and EPA112 increased to 1400 GPM to make up for lost flow of Well EPA110.

DHS=California Department of Health Services  
EPA=United States Environmental Protection Agency  
GPM=gallons per minute  
OU=operable unit  
O&M=operations and maintenance  
VFD=variable frequency drive

**Table 5-8**  
**Summary of Extraction Well Flow Data**  
**December 2005**

Extraction Well	Monthly Extracted Water Volumes (acre-ft)	Average Monthly Flow Rate (gpm)	Cumulative Volume Extracted <sup>(a)</sup> (acre-ft)	Number of Days in Month =	31
				Monthly Run Time (days)	Monthly Down Time (days)
Muscoy Plume Extraction Well Network					
EPA 108	181.0	1,321	1,624	30.9	0.1
EPA 109	193.8	1,414	1,592	29.4	1.6
EPA 110	300.0	2,189	2,471	29.6	1.4
EPA 111	292.0	2,132	2,520	27.5	3.5
EPA 112	189.8	1,386	1,389	31.1	-0.1
Network Total	1156.6	8,442	9,597		

(a) - Cumulative volume extracted since Muscoy commenced operations in March 2005.

acre-ft=volume of water sufficient to cover an acre of land to a depth of 1 foot, or approximately 325,851 U.S. gallons.

gpm=gallons per minute

EPA=United States Environmental Protection Agency

**Table 5-9**  
**3-Month Rolling Average Extraction Volume and Extraction Rate Calculations**  
**December 2005**

Extraction Well	Run Times (Days)				Total Down Time For Last 3 Months	Extraction Volumes (acre-ft)				Extraction Rates (gpm)			
	October 2005	November 2005	December 2005	Total For Last 3 Months		October 2005	November 2005	December 2005	Total Pumpage Last 3 Months	3-Month Rolling Average Extraction Rate	Design Extraction Rate (DER)	Target Extraction Rate (TER) <sup>(a)</sup>	Difference Between 3-Month Rolling Average and TER
Days in Period >>	30	31	31	92									
<b>Muscoy Plume Extraction Well Network<sup>(b)</sup></b>													
EPA 108	30.9	28.8	30.7	90.4	1.6	173.9	160.3	181.0	515		1300		
EPA 109	29.4	28.9	31.2	89.5	2.5	171.8	168.7	193.8	534		1300		
EPA 110	29.6	29.5	27.0	86.1	6.0	289.1	292.1	300.0	881		2500		
EPA 111	27.5	14.5	28.0	70.0	22.0	321.3	257.0	292.0	870		2500		
EPA 112	31.1	29.4	31.2	91.7	0.3	179.0	169.1	189.8	538		1300		
<b>Network Total</b>						<b>1135.3</b>	<b>1047.3</b>	<b>1156.6</b>	<b>3,339</b>	<b>8,212</b>	<b>8,900</b>	<b>8,046</b>	<b>166</b>

(a) = The TER is currently equal to the maintenance-adjusted DER, which is adjusted for a maintenance allowance of 35 days per year.

(b)= Muscoy Plume extraction well network is not O&F, and the DER has not been finalized. Per the terms of the SOW, the DER will be no higher than what is shown.

DER =Design Extraction Rate

acre-ft=volume of water sufficient to cover an acre of land to a depth of 1 foot, or approximately 325,851 U.S. gallons.

gpm=gallons per minute

O&F=Operable and Functional

SOW=Statement of Work (entered with CD March 23, 2005)

TER=Target Extraction Rate

**Table 5-10**  
**Summary of Newmark OU O&M - Water-Level Monitoring**  
**December 2005**

**Reporting Period:** December 2005  
**System Operation Date:** October 1, 2000  
**Operations Completed:** 5 years 3 months

<b>Newmark and Muscoy OU Monitoring Wells</b>	
Description of routine monitoring and maintenance performed	Periodic download of RTU based water-level data and RTU hardware, software, and sensor checks. Collection of manual water levels to verify RTU based readings.
Description of problems encountered	None.
Description of process improvements implemented	None.
Deviations from the operational requirements of the consent decree	None. Daily water-level readings were collected each day as required by the SOW.
<b>Newmark and Muscoy OU Extraction Wells</b>	
Description of routine monitoring and maintenance performed	Periodic download of water-level data from RTUs as part of the completion of the Muscoy OU startup aquifer testing (per the schedule in the EPA/URS Field Sampling Plan) and less frequently for extraction wells monitored as part of Newmark OU IRA operation
Description of problems encountered	EPA 001 had a defective radio and was replaced. No data was lost.
Description of process improvements implemented	None.
Deviations from the operational requirements of the consent decree	None. Daily water-level readings were collected each day as required by the SOW.
<b>Site-Wide Monitoring Wells</b>	
Description of routine monitoring and maintenance performed	Collected monthly manual water-level measurements on December 19, 2005
Description of problems encountered	The City is unable to collect Site-wide manual water levels from some of the wells designated in the SOW due to access limitations, water-level depths beyond the length of the sounding tape or omissions. See list below.
Description of process improvements implemented	None.
Deviations from the operational requirements of the consent decree	The Site-wide manual water levels were not collected from the following wells: MW 126 (well appears to be dry), PZ-124 (well appears to be dry,) PZ 125 (well has been located and is in the process of determining the condition of the well for monitoring)
<b>Wells Monitored Voluntarily</b>	
Description of routine monitoring and maintenance performed	Collected monthly manual water-level measurements. Downloaded electronic water-level data from USGS website.
Description of problems encountered	None.

IRA=Interim Remedial Action  
OU=operable unit  
O&M=operations and maintenance  
RTU=remote telemetry unit  
SOW=Statement of Work  
USGS=United States Geological Survey



**Table 5-11**  
**Muscoy Plume Groundwater Elevations Used For Contouring**

Well	HS Zone	Easting <sup>a</sup> (ft)	Northing <sup>a</sup> (ft)	Groundwater Elevation 12/19/05
<b>Shallow Zone</b>				
EW-001A	1	6775522	1866594	920.29
EW-002A	1	6776472	1866742	933.86
EW-003A	1	6777152	1866776	929.41
EW-004A	1	6777957	1866566	922.94
EW-005A	NA	6778998	1866536	932.19
EW-108A	NA	6773788	1868089	928.76
EW-109A	NA	6771905	1868375	935.6 <sup>b</sup>
EW-110B	NA	6770268	1868169	927.99
EW-111B	NA	6768387	1868531	909.23
EW-112A	1	6766938	1868507	921.3 <sup>b</sup>
MW-012A	1	6774894	1865969	936.22
MW-013A	1	6776958	1866005	915.01
MW-014A	1	6778308	1865949	933.31
MW-128A	1	6768012	1873207	965.1
MW-129A	1	6766410	1869927	942.33
MW-130A	1	6770220	1871569	954.59
MW-135A	1	6773043	1866906	928.56
MW-137A	1	6769013	1867110	937.01
MW-138A	1	6767776	1867135	938.7
MW-139A	1	6766120	1866924	942.15
Garner Park B	1	6769989	1864990	NA
MUNI-103 (State St.)	1	6762726	1870149	948.43
Darby	1	6763750	1875800	986.7 <sup>b</sup>
<b>Intermediate Zone</b>				
EW-109B	2	6771907	1868376	870.3 <sup>b</sup>
EW-110D	2	6770269	1868169	868.86
EW-111C	2	6768388	1868531	894.45
EW-112B	2	6766938	1868507	915.0 <sup>b</sup>
MUNI-101 (Olive & Garner)	2	6769831	1866362	941.67
MUNI-18 (27th & Acacia)	2	6774721	1874598	911.74
MUNI-23 (16th & Sierra)	2	6777829	1870023	932.88
MW-128C	2	6768012	1873207	903.07
MW-129B	2	6766410	1869928	943.91
MW-130C	2	6770220	1871568	898.86
MW-136B	2	6771196	1866640	899.74
MW-137B	2	6769013	1867110	909.77
MW-138B	2	6767777	1867135	919.48
MW-139B	2	6766119	1866924	937.69

**Table 5-11**  
**Muscoy Plume Groundwater Elevations Used For Contouring**

Not Used				
EW-001B	3	6775522	1866594	887.56
EW-002B	3	6776472	1866742	887.15
EW-003B	3	6777152	1866776	868.97
EW-004B	3	6777957	1866566	892.83
EW-005B	3	6778998	1866536	888.58
EW-108B	3	6773788	1868089	884.95
EW-109C	3	6771908	1868376	844.16
EW-110A	0.5	6770268	1868168	934.40
EW-110C	1.9	6770269	1868168	883.82
EW-110E	3	6770288	1868151	845.22
EW-111A	0.5	6768387	1868531	939.66
EW-111D	2.1	6768407	1868515	881.82
MUNI-108 (Mallory 3)	2	6759545	1875165	941.67
MUNI-16 (Leroy)	1*	6779098	1877196	NA
MUNI-24 (Gilbert)	2	6779933	1869306	NA
MW-010A	1.5	6776744	1869213	918.15
MW-010B	1.9	6776744	1869213	906.56
MW-011A	3	6777619	1867493	900.67
MW-011B	3	6777619	1867493	900.75
MW-011C	3	6777619	1867493	899.46
MW-012B	3	6774894	1865969	895.72
MW-013B	3	6776958	1866005	894.53
MW-013C	3	6776958	1866005	902.98
MW-014B	3	6778308	1865949	896.76
MW-128B	1.5	6768012	1873207	935.17
MW-129C	2.1	6766411	1869927	911.35
MW-130B	1.5	6770221	1871569	927.77
MW-135B	3	6773044	1866906	887.29
MW-135C	3	6773044	1866906	893.54
MW-136A	1.9	6771196	1866640	908.91
MW-136C	3	6771195	1866640	880.39
MW-137C	3	6769013	1867109	900.00
MW-138C	3	6767777	1867135	889.59
MW-139C	3	6766119	1866924	929.71

\*Not able to determine.

<sup>a</sup> State Plane NAD 83 Feet

<sup>b</sup> Corrected or extrapolated water level

ft bgs=feet below ground surface

HS= Hydrostratigraphic zones: Zone 1 = shallow (<500 ft bgs). Zone 2 = Intermediate. Zone 3 = Deep.

Fractional values indicate intermediate water levels.

NA= not available

NAD=North American Datum

**Table 5-12**  
**Extraction and Monitoring Well Monitoring Results - PCE and TCE**  
**December 2005**

Extraction Well	Date Sampled	PCE Concentration (µg/L)	TCE Concentration (µg/L)
<b>Muscoy Plume Extraction Well Network</b>			
EPA 108 *	NM	NM	NM
EPA 109 *	NM	NM	NM
EPA 110 *	NM	NM	NM
EPA 111 *	NM	NM	NM
EPA 112 *	NM	NM	NM
EW-108	12/14/2005	1.7	0.54
EW-108PA	12/14/2005	1.3	<0.5
EW-108PB	12/14/2005	ND	ND
EW-109	12/14/2005	2.3	0.67
EW-109PZA	12/14/2005	7	2.2
EW-109PZB	12/14/2005	0.68	ND
EW-110	12/14/2005	3.3	0.84
EW-110PZA	12/13/2005	1.9	<0.5
EW-110PZB	12/13/2005	7.6	1.7
EW-110PZC	12/13/2005	8.3	2.7
EW-110PZD	12/13/2005	3.2	2.1
EW-110PZE	12/14/2005	ND	ND
EW-111	12/14/2005	2.6	<0.5
EW-111PZA	12/14/2005	1.8	<0.5
EW-111PZB	12/14/2005	0.7	ND
EW-111PZC	12/14/2005	0.93	ND
EW-111PZD	12/14/2005	<0.5	ND
EW-112	12/14/2005	1.9	ND
EW-112PA	12/14/2005	1.4	ND
EW-112PB	12/14/2005	0.5	ND
MW-128A	12/13/2005	10	2.6
MW-128B	12/13/2005	ND	ND
MW-128C	12/13/2005	ND	ND
MW-129A	12/12/2005	ND	ND
MW-129B	12/12/2005	3	<0.5
MW-129C	12/12/2005	ND	ND
MW-130A	12/13/2005	2	<0.5
MW-130B	12/13/2005	7.7	1.8
MW-130C	12/13/2005	ND	ND
MW-135A	12/13/2005	5.5	1.7
MW-135B	12/13/2005	ND	ND
MW-135C	12/13/2005	ND	ND

**Table 5-12**  
**Extraction and Monitoring Well Monitoring Results - PCE and TCE**  
**December 2005**

Extraction Well	Date Sampled	PCE Concentration (µg/L)	TCE Concentration (µg/L)
<b>Muscoy Plume Extraction Well Network</b>			
MW-136A	12/13/2005	ND	ND
MW-136B	12/13/2005	ND	ND
MW-136C	12/13/2005	ND	ND
MW-137A	12/12/2005	3.5	0.92
MW-137B	12/12/2005	ND	ND
MW-137C	12/12/2005	ND	ND
MW-138A	12/12/2005	3.4	<0.5
MW-138B	12/12/2005	ND	ND
MW-138C	12/12/2005	ND	ND
MW-139A	12/12/2005	<0.5	ND
MW-139B	12/12/2005	ND	ND
MW-139C	12/12/2005	ND	ND

\* Data provided by SBMWD

µg/l=microgram per liter

ND=Not detected above the method detection limit

NM=Not monitored during the reporting period

PCE=tetrachloroethene

SBMWD=City of San Bernardino Municipal Water Department

TCE=trichloroethene

**Table 5-13**  
**Treatment Plant Monitoring Results - PCE and TCE**  
**December 2005**

Extraction Well	Date Sampled	PCE Concentration (µg/L)	TCE Concentration (µg/L)
<b>19th Street GAC Treatment Plant</b>			
Influent	14-Dec-05	4.3	0.9
Lead Vessel 1	14-Dec-05	0.1	<0.5
Lead Vessel 2	14-Dec-05	0.1	<0.5
Lead Vessel 3	14-Dec-05	0.6	<0.5
Lead Vessel 4	14-Dec-05	0.6	<0.5
Lead Vessel 5	14-Dec-05	0.6	<0.5
Lead Vessel 6	14-Dec-05	<0.5	<0.5
Lead Vessel 8	14-Dec-05	0.6	<0.5
Lead Vessel 9	14-Dec-05	0.7	<0.5
Lead Vessel 10	14-Dec-05	<0.5	<0.5
Lead Vessel 11	14-Dec-05	<0.5	<0.5
Lead Vessel 12	14-Dec-05	0.5	<0.5
Lead Vessel 13	14-Dec-05	<0.5	<0.5
Combined Effluent	1-Dec-05	<0.5	<0.5
	8-Dec-05	<0.5	<0.5
	14-Dec-05	<0.5	<0.5
	21-Dec-05	<0.5	<0.5
	28-Dec-05	<0.5	<0.5

These data have been collected and validated using standard SBMWD protocol as required under SBMWDs DHS Permit. Once the project QA/QC Plan has been prepared and approved, SBMWD will adhere to the QA/QC plan when sampling the extraction wells and validating data.

GAC=granular activated carbon

DHS=California Department of Health Services

µg/l=microgram per liter

PCE=tetrachloroethene

QA/QC=quality assurance/quality control

SBMWD=City of San Bernardino Municipal Water Department

TCE=trichloroethene

**Table 5-14**  
**Summary of Compliance with Performance Criteria**  
**December 2005**

Extraction Well Network	Compliance Criteria Met (yes/no)	Comments
<b>Flow Rate Performance - Target Extraction Rate</b>		
Muscoy Plume Extraction Well Network	Yes	The 3-month rolling average (October 2005 to December 2005) extraction rate for the Muscoy OU wells was 8,212 gpm, which exceed the TER of 8,046 gpm.
<b>Flow Performance - Particle Tracking</b>		
Muscoy Plume Extraction Well Network	SCADA System and RTU System Maintenance	The 3-month rolling average exceeded the TER, requiring 85% upgradient capture. During December 2005, 87.5% upgradient capture was achieved in the shallow zone and 100% upgradient capture was achieved in the intermediate zone.
<b>Contaminant Performance - Downgradient Monitoring Wells</b>		
Muscoy Plume Extraction Well Network	Other	MW135A, MW137A, MW138A had PCE concentrations above 1 ug/L. MW135A, MW138A and MW139A had increasing trends Pre-Startup. MW135A, MW137A and MW139A had increasing trends Post-Startup. MW135A, MW138A and MW139A had increasing historical trends.

gpm=gallons per minute  
ug/L=micrograms per liter  
NA=not applicable  
OU=operable unit  
TER=target extraction rate